

Mpox Outbreak Investigation in Ikelenge District, 2024: A Single-Case Analysis

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Cite this article

Mutiti G, Muntanga K, Sampa K, Mulenga MM, Kolapo A, Liamba F. Mpox Outbreak Investigation in Ikelenge District, 2024: A Single-Case Analysis. *Health Press Bull.* 2024;08(2):6-8.

SUMMARY

On 30th May, 2024, the Ikelenge District Health Office in North Western Province alerted the Zambia National Public Health Institute of a suspected Mpox case at Jimbe Health Post. A case investigation was conducted involving interviews, review of medical records and contact tracing

One suspected case of Mpox was identified. A 13-year-old female presented with symptoms consistent with the case definition of suspected Mpox. Additionally, three contacts were identified of which none met the case definition for a suspected case. PCR and serological testing of crusts, collected from the primary case yielded negative results for Mpox.

The prompt detection of the alert demonstrates a functional early warning system. However, the strengthening laboratory systems is crucial to aid rapid detection and verification of potential cases.

INTRODUCTION

Monkeypox (now formally known as Mpox) is a zoonotic disease caused by the monkey pox virus (MPXV), which belongs to the Poxviridae family (Tiecco et al., 2022). It is endemic to central and western Africa (Gao et al., 2023). The disease was first discovered in 1958 and reported in humans in 1970. Before 2017, Mpox mainly occurred in central

and western Africa, where the virus was sustained in local animal reservoirs, leading to occasional spillover into human populations, particularly in rural areas (Yu et al., 2023). Since 2017, ongoing human-to-human transmission has been reported in western Africa, resulting in occasional cases exported to other countries from 2018 to 2021 (Gao et al.,

2023). The virus primarily spreads through direct contact with infected lesions and bodily fluids, though it can also be transmitted via respiratory droplets and contaminated surfaces. The ongoing outbreak of clade 1b which began in September 2023 has affected at least 12 countries, with over 17,000 suspected cases reported in 2024. The majority of these cases have been reported in the Democratic Republic of Congo (Adepoju , 2024; Africa CDC, 2024a). Zambia is on high alert due to its close proximity to the DRC.

On May 30, 2024, Ikelenge District Health Office in North Western Province, Zambia, alerted the Zambia National Health Institute (ZNPHI) of a suspected Mpox case from Lukuma Village under the Jimbe Health Post. This alert was triggered by a patient who presented with symptoms suggestive of Mpox. The date of onset for the patient’s symptoms was May 23, 2024. The Jimbe Catchment Area under Ikelenge is situated along the border with Angola in Northwestern Province (see figure 1). It is characterized by cross-border activities including trade and serves as a point of entry. Ikelenge District is boarded by Angola on the Western and the Democratic republic of Congo on the north east. Given the district's geographic location, it is prone to importation of Mpox infection. Therefore, an outbreak investigation team

comprised of Field Epidemiologists, Clinicians, and Public Health Officers from both ZNPHI and the Ministry of Health was deployed immediately. The aim of the investigation was to verify the alert and assess outbreak potential.

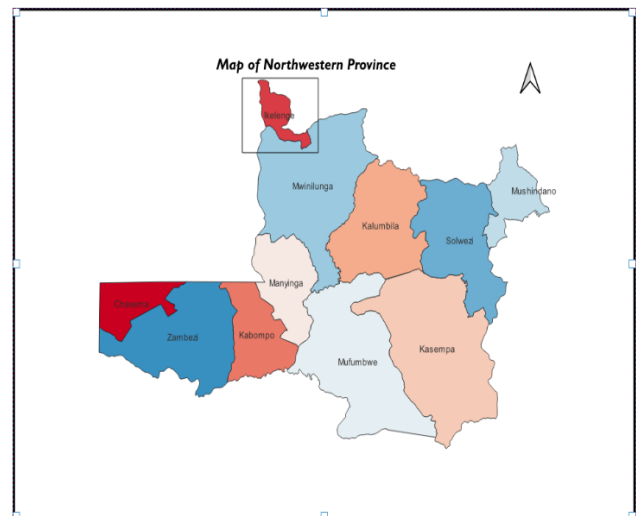


Figure 1 Geolocation of the case investigation site, Jimbe Catchment Area, and Lukuma Village.

METHODS

We conducted a case investigation on the reported patient from 4th to 10th June, 2024. The team reviewed medical records and conducted contact tracing. A suspected case was defined as any resident of Lukuma Village presenting with an unexplained acute rash, mucosal lesions, or lymphadenopathy within a 21 days retrospective window. Specimens, including crusts, swabs, and blood, were collected for Real time polymerase chain reaction (PCR) testing in accordance with recom-

mended Africa CDC [Mpox molecular diagnostic tests guidelines](#) (Africa CDC, 2024b).

RESULTS

Case presentation

Review of medical records and examinations indicated that the reported patient met the case definition of suspected Mpox. The suspected case was identified as a 13-year-old female from Lukuma Village, Ikelenge District. She presented with a one-day history of rash and fever, preceded by abdominal discomfort. The fever persisted, and the generalized rash affected both upper and lower limbs bilaterally. Initially, the rash discharged clear fluid, which later turned to pus-like drainage, lasting 3-4 days before crusting over 7 days. Figure 1 shows lesions on the suspected case.

Further examination revealed malaise, lower backache, and a limping gait due to right thigh pain, with axillary, cervical, and inguinal lymphadenopathy. The suspected case did not report a cough, sore throat, diarrhea or vomiting and denied recent travel, or contact with symptomatic individuals. She had regular contact with domestic animals, including chickens, goats, dogs, and cats. Epidemiological assessments revealed no definitive link between the suspected case and individuals from endemic regions

Contact tracing

The investigation identified three household contacts, two adult females and a male child aged four years old. One of the adults who was the suspected case's mother had oral lesions treated as candidiasis but did not meet the Mpox suspected case definition. Likewise, two other contacts, an adult female neighbor and her four-year-old son did not meet the case definition for a suspected case upon examination.

Laboratory tests

The real-time polymerase chain reaction test of crusts did not detect monkey pox viral (MPXV) DNA.



Figure 2 Lesions in a suspected case of mpox, Jimbe, Northwestern Province, 2024

DISCUSSION

This investigation aimed to verify an alert received from Ikelenge District in Northwestern Province concerning a patient with symptoms suggestive of Mpox. A review of medical records indicated that the patient, a

13-year-old female from Lukuma Village, presented symptoms consistent with the case definition for suspected Mpox. Consequently, contact tracing was initiated in line with the World Health Organization's interim guidance on surveillance, case investigation, and contact tracing for Mpox. This guidance recommends that contact identification and tracing should begin while further investigation of the suspected case is ongoing (World Health Organization, 2024). Three household contacts were identified; however, none met the case definition for suspected Mpox.

Since no additional suspected cases were identified, specimens for laboratory confirmation were collected only from the primary reported case. According to the WHO's interim guidance, confirmation of an Mpox case is determined by the detection of MPX viral DNA through real-time polymerase chain reaction (PCR) and/or sequencing (Moyo et al., 2022). PCR testing of crust samples collected from the suspected case did not detect MPX viral DNA. As a result, the investigation ruled out an Mpox outbreak based on these findings.

It is worth noting that Zambia has capacity to diagnose Mpox and the long turnaround time for laboratory confirmation observed in the present study was due to logistical

challenges associated with sample collection and laboratory testing. For example, Lukuma Village is located in a remote part of Ikelenge District, over 341 km from the provincial health office and 921 km from Lusaka, where the designated lab is located. This distance posed a challenge in transporting samples for analysis, thus increasing the turnaround time. Similar issues were observed in other rural settings during the COVID-19 pandemic (Moyo et al. 2022). Moyo et al. (2022) also note that the lack of refrigeration or a reliable power supply in some health facilities to maintain specimen viability while awaiting transportation to diagnostic centers hampered laboratory diagnostic capability in most African countries during the COVID-18 pandemic. This is particularly problematic for remote areas lacking the necessary logistics for sample collection, handling, and dispatch.

While this investigation demonstrated a functional early warning system, it also highlights the need to strengthen laboratory systems for swift public health action. Studies indicate that weaknesses in testing capacity can lead to delays in outbreak identification, as evidenced in some African countries during previous COVID-19 and Ebola outbreaks (Afolabi et al., 2021).

Accelerating efforts to strengthen laboratory systems is crucial during the ongoing Mpox outbreak, particularly as cases are emerging in African countries that previously never reported human Mpox transmission (Bunge et al., 2022; WHO, 2022). For example, currently, the Ministry of Health in Zambia with support from the Global Fund is improving laboratory systems and diagnostics, as well as recruiting and building capacity of laboratory staff (The Global Fund, 2024). It is essential that these efforts be expedited to ensure that ZNPFI can respond to public health threats timely.

Finally, strengthening Mpox surveillance and case investigation is critical not only for the rapid identification of cases but also to inform implementation of control and prevention measures (WHO, 2024). It is crucial that public health actions be implemented immediately following an alert and not be delayed by laboratory confirmation.

CONCLUSION

We conducted a case investigation of Zambia's first suspected Mpox case reported in Ikelenge District, North Western Province. Using the case definition for a suspected case, only one individual met the criteria, and subsequent laboratory results were negative. The prompt detection and initiation of the investigation highlight the effectiveness of the

existing early warning system. However, it is essential that preparedness efforts include plans to strengthen laboratory diagnosis and addressing logistical challenges especially associated with remote areas.

ACKNOWLEDGEMENTS

Acknowledgment to the Zambia National Public Health Institute for its invaluable technical and logistical support throughout the investigation and staff at the sub-national level in Northwestern Province for their significant contributions and support

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